DECLARATION

I MUNYURWA CHARLES declare that this project proposal is original and has not been published or submitted for any other academic award to any other university before to the best of my knowledge.

The literature and citations from other people‘s work have been duly referenced and acknowledged.

Signed: Date:

……. ……

MUNYURWA CHARLES

STUDENT

APPROVAL

This is to certify that graduation project was conducted under my supervision and guidance.

And will be submitted to the Faculty of Information and Communication Technology with my Approval.

Signed: Date:

……
……..

SUPERVISOR:

DEDICATION

This project report is dedicated to my Father and Mother without whom my education would not have been a success. Thanks you for providing and standing by me in all my academic pursuits and life for all these years. World cannot express how much I love and feel about you. You have been everything to me. It is also dedicated to my dear brother and sister, friends and relatives who supported and prayed for my success. May the the almighty God bless you abundantly. And to my supervisor …….. who has been a great source of inspiration and stewardship throughout my academic years at St Lawrence University.

ACKNOWLEDGEMENT

All praises to the almighty God for His blessings which has given me wisdom, patience, strength and ability to complete this project. His love, care, protection, comfort, supports and provision is just overwhelming. All the Glory belongs to Him.

Writing a book is not a small task. Although the authors' names go on the cover and they get most of the credit, tons of people behind the scenes at a press really make it happen. In particular; I would like to express my highest gratitude to my entire family for being supportive and understanding. My Father and My Mother. I am doubly indebted to my My Sister.

Special debt of gratitude is owed to HIMANA THEOGENE, RWIBUTSO ALICE for praying for me and for being supportive and lending a helpful ear about various issues during the time that I have engaged in this project. To my supervision ……for the idea of this project and his willingness to spend precious time to help and guide me to get the best result for this project.

Special thanks also go to the dean of the faculty of Information and Computer Technology Mr. JOHN BOSCO LUBEGA and all lecturers at the faculty of ICT for their guidance, focus and positive criticisms that enabled us to complete this project.

Above all glory to the almighty for the great help, joy and happiness that have enabled me finish this project. Last but not least, thank you to those who know me and have me and helped me indirectly in the completion of this project. I have probably missed a few people who should be on this list; I hope all who are deserving of my appreciation will forgive their omission and accept my thanks.

Thanks you to all of you and may God bless you all.

ACRONYMS

DMS: Diary Management System

VS: Visual Studio 2010

OS: Operating System

ERD: Entity Relationship Diagram

UML: Unified Modeling Language

TIDE: The Inclusive Dairy Enterprise

MAAIF: Ministry of Agriculture Animal Industry Fisheries

FAOUN: Food and Agriculture Organization of the United Nations

DDA: Dairy Development Authority

ABSTRACT

Dairy Management Software was developed in consultation with the leading Breed Societies, as well as dairy consultants, vets and farmers. The electronic transfer of information between you and your Breed Society is very easy, time spent at the computer is at a minimum and useful information is available for consultants to assist the farmer, in important decision making about the dairy.

An inventory management system is content application for storing, managing, and retrieval of all the records that are stored in a database.

This project can be best described as a pertinent undertaking as far as the solutions to the problems facing the milk management. This mainly centered on problems facing the keeping milk by location and category.

The project focused on developing a dairy management system that can monitor your milk to ensure tank available especially when you receive a big for a product that you are running low on.

Dairy Management System provides a great list of important features that helps you deliver the right milk to people in a quick and efficient manner. It offers a good set of options when searching for milk, sales report and milk in tank balance. Running a business can be challenging for anyone, therefore it is important to keep milk of your sales. DMS allows you to set up access and different level of access for each user. This is important if you are concerned about who want to have access to your complete sales and milk tank.

To achieve this objective, a quantitative and a qualitative research design was used where by interviews and questionnaires were used as the research instruments in data collection.

Tools used in the design and development of the system were dataflow diagram, V-model, Microsoft Access and Visual Studio the results of the validation of implemented system using test data are described.

Contents

DECLARATION i
APPROVAL ii
DEDICATION iii
ACKNOWLEDGEMENT iv
ACRONYMS v
ABSTRACT vi
CHAPTER ONE 1
1.0 Introduction 1
1.1 Background of the study 1
1.1 Statement of the problem 2
1.1 Objective of the study 2
1.1.0 General objective of the study 2
1.1.1 Specific Objectives 2
1.1 Research Questions 2
1.1 Scope of the study 3
1.1.1 Geographical scope 3
1.1.1 Content Scope 3
1.1.1 Time Scope 3
1.1 Significance of the study 3
CHAPTER TWO 4
LITERATURE REVIEW 4
2.0 Introduction 4
POLICY AND REGULATORY ENVIRONMENT 4
2.1 Dairy Sector Policy and Legal Framework 4
2.2 The Dairy Master Plan (1993) 4
2.3 Dairy Industry Act, 1998 5
2.4 Important Livestock Sub-sector Policies 5
2.4.1 Policy on marketing of livestock and livestock products 5
2.4.2 Animal health policies 5
2.4.3 Animal Breeding Policy 6
2.4.4 The National Animal Feeds Policy 6
2.5 Broad National Development Policy Framework 6

2.6 Dairy Industry Standards and Regulations 7
3.6.1 The Dairy (Marketing and Processing of Milk and Milk Products) Regulations, 2003 8
2.6.2 Code of hygienic practice for milk and milk products 8
2.6.3 Standards for milk and milk products 8
2.6.4 Other legal instruments governing the sale of milk and milk products 9
2.7 Operating Licenses and Fees 9
2.8 Conceptual Framework 10
METHODOLOGY 11
3.0 Introduction 11
3.1 Research design 11
3.2 Study population 11
3.3 Sampling and sample size 11
3.4 Data collection Tools 12
3.4.1 Instruments for Data Collection 12
3.4.2 Questionnaires 12
3.4.3 Interviews 12
3.5 Data Analysis 12
3.5.1 Qualitative data analysis 12
3.5.2 Quantitative data analysis 12
3.6 Data Presentation 13
3.6.1 Qualitative Data Presentation 13
3.6.2 Quantitative Data Presentation 13
3.7 System Design 13
3.8 Research Procedures 13
References ..... **Error! Bookmark not defined.**

CHAPTER ONE

1.0 Introduction

Generally, in this time of information where the technology of the data information increases to a galloping speed, all activities of the associations have the tendency to be computerized in order to change the working of the manual system in computerized system for having faster delivering of information. Information technologies is one the first area that is more useful in today's world and play a big impact in the development of each country in the world.

With the introduction of new technologies in software, server management, database system, and hardware innovation in the past decade, Dairy operation have been improved from vendors who build such products geared towards streamlining many of the time consuming workflow processes farming. This chapter covers a brief background of the study and the history of the management system, the problem state, the specific objectives, and the research question, the scope of the study and the significance of the study.

1.1 Background of the study

The study included traditional especial in Uganda country It began for this man contemplating farming when he retirement from the army became eminent. Having worked in the army for 23 years, he had only two options for retirement: look for a job and continue working for someone or work for himself. In deciding to work for himself he also found that he had two options: stay in the urban centre and sell airtime or move back to the village and explore the immense untapped opportunities. he chose to move back to the village and use his land to make money. he started with what he knew and had grown up doing- looking after their ankole cattle. he soon realised that having 600 herds of ankole cattle was not as prestigious as he was made to think. The cows were not as productive and yet he still needed a significant number of staff to look after his cattle.he expenses were too much for me to manage. He decided to venture into beef farming with Boran bulls. he sold all the 600 ankole cattle that he had and bought 300 Boran bulls for beef. Beef farming soon lost its glitter and he was faced with the stark realisation that he had taken on a project that demanded more resources than he had. he needed more land which he didn't have. That was the turning point for me. It also taught me one of many lessons that he have learnt about business. As an entrepreneur, you have to be able to make tough decisions and stick with them.

In 2010, they procured the services of a professional business analyst – Dr. Florence Kasirye - who helped them develop a five-year business plan for commercial dairy farming. In a period of one month he sold all the 300 Boran bulls and bought 150 Friesian cows which he personally selected. That is when AGDI Dairy Farm was born and he have never looked back.

100 of his heifers were 5 months in-calf and within a period of 5 months he was getting 400 litres of milk. That was productivity. he got rid of 50 cows and stayed with 100. This taught me his second lesson about

business: profit is not in quantity but in quality. their local cows are bad for business because they are not productive and without productivity you cannot make profit.

1.1 Statement of the problem

The current dairy milk management system in Uganda was working under stressful and unconducive condition which was mainly manual.

There was a poor file storage and retrieval which lead to time consuming. Furthermore, there was a lack of enough skilled workers also impacts more on the normal operation of dairy milk distribution.

This therefore has led the research to come up with an investigation to find solution to the above mentioned problems.

1.1 Objective of the study

1.1.0 General objective of the study

The general purpose of the study was to come up with a computerized dairy management system that would be in a position to capture, store, manage and retrieve milk data as fur milk sales is concern.

1.1.1 Specific Objectives

The specific objectives of the study were:

- **I.** To study and find out the underlying problems with the current dairy management system.
- **Ii.** To identify the user requirements for the computerized dairy management system.
- **Iii.** To Design the computerized dairy management system.

1.1 Research Questions

This refers to questions which the Researcher asked to undertake the study:

The research questions for this project included the following:

- **i.** What are the weaknesses of the current manual dairy management system?
- **ii.** What are the user requirements for the computerized dairy management system?
- **iii.** What are the requirements for design the computerized dairy management system?

1.1 Scope of the study

1.1.1 Geographical scope

This study is about an electronic dairy management system. This study was conducted in Uganda at Hope Dairy in Mbarara (Uganda), Ankole.

1.1.1 Content Scope

The proposed Electronic dairy management system supports the process of keeping details of milk sales, tank remaining and at the same time provides an interactive way for the system to correspond with the seller as it automatically update the records in the database immediately as sale is made and notifies the seller in case an item is out of tank and shows him which shelf that item is located for easy work.

1.1.1 Time Scope

The Researcher carried out research 2010

1.1 Significance of the study

Dairy management system provides backup and recovery to ease the work of database administration. Besides that, this project eased the staff works in the Dairy and increased the work dairy made it easy to set and meet sales goals and make your company more productive. The dairy milk spent less time in serving the customer who comes to the dairy and because of that the dairy got more attention to the public.

The study enabled different people in Hope Dairy Ltd Mbarara-Uganda to know and understand the advantage of dairy management system over the traditional management system giving them the ability to analyze sales, produce reports and manage milk tank or milk stock. This study showed how good quality management determines good decision making in any organization.

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section includes critical review of previous work and system related to dairy management system as well as an analysis of the existing knowledge related to the study. The review includes research work from journals and books cited with the objective of revealing contributions, weakness and gaps within the subject.

POLICY AND REGULATORY ENVIRONMENT

2.1 Dairy Sector Policy and Legal Framework

After completion of the first phase of rehabilitation the dairy industry in 1992, Government adopted a whole dairy sector approach as opposed to interventions in limited areas. A complete review of the official dairy sectorpolicy was undertaken through a comprehensive dairy sector Master Plan study. The findings and recommendations of the Dairy Master Pan
study together with lessons learned during implementation of the UNDP/FAO dairy project formed the basis for a comprehensive dairy sector policy published in 1992.

The official policy, besides endorsing the UNDP/FAO Project model on producer marketing groups, clearly emphasised the role dairy producer groups would play in development of the sector. The second area of emphasis concerns the provision of support services to dairy farmers. Government support services would be rehabilitated and concentrated in milk-
sheds selected on the basis of comparative advantage. Where the service benefited the dairy sector and the nation in general, government would fund the service. Where the service directly benefited individual farmers or farmer groups and where the latter would be willing and able to pay for the service such as artificial insemination, the users would incur the cost of service. Veterinary services would be privatised. With regard to research, the
policy clearly stated that research would address practical problems faced by dairy farmers in Uganda and research priorities would be established in close collaboration with the farmers.

The new dairy sector policy also recommended the establishment of a Dairy Board to regulate, co-ordinate and promote development of the dairy sector. Farmers would be strongly represented on the Board. The policy also introduced a unified agricultural extension service. Key aspects of the official dairy sector policy are contained in the Dairy Master Plan that was adopted by government in 1993.

2.2 The Dairy Master Plan (1993)

The Dairy Master Plan made a number of recommendations aimed at reviving the dairy
sector. Some of the key recommendations include:

- **i)** Liberalization of the dairy industry
- **ii)** Restructuring of the government owned dairy processing company, Dairy Corporation into a commercial company that would be privatized later.
- **iii)** Establishment of a Dairy Board to assume the development and regulatory functions of Dairy Corporation.

Indeed, government liberalized the dairy industry in 1993 and five years later, Parliament enacted the Dairy Industry Act, 1998, which provided the legal framework for establishing a new statutory body, Dairy Development Authority to regulate the liberalised dairy industry.

The Act also provided for restructuring of the government owned Dairy Corporation into a commercial company; Dairy Corporation Limited (DCL) initially owned 100% by government but would be privatised later.

2.3 Dairy Industry Act, 1998

The Dairy Industry Act, 1998, provides the legal framework for implementing the key recommendations of the Dairy Master Plan. The Act established Dairy Development Authority (DDA) as a semi-autonomous, statutory body to oversee the development and regulation of the dairy industry. The Act also provided the legal framework for restructuring of the government owned Dairy Corporation into a commercial company; Dairy Corporation Limited (DCL) initially owned 100% by government but would be privatised later. Privatisation was completed in 2006 when a new private operator, Sameer Agriculture and Livestock Ltd took over full control and management of the company asset.

2.4 Important Livestock Sub-sector Policies

2.4.1 Policy on marketing of livestock and livestock products

Some of the major challenges to livestock development are related to the nature of marketing and marketing infrastructure. Limited market opportunities, lack of storage and agro-processing facilities are key constraints in the marketing of agricultural produce. To improve farmer access to local and international markets, there was need to formulate an appropriate marketing policy. This had been identified as one of the priority areas for intervention under the Plan for Modernisation of Agriculture (PMA). A committee was constituted to develop strategies for marketing and processing of agricultural produce.

2.4.2 Animal health policies

Following implementation of the broader national policies such as trade liberalisation, privatisation, and decentralization, it was necessary to revisit policies and Acts related to the control of livestock diseases and delivery of veterinary services. Accordingly, the following policies were formulated:

- Policy on delivery of veterinary services
- National Veterinary Drug Policy

In order to support the implementation of the above policies, the following Acts were also reviewed/ formulated: Veterinary and Para-Veterinary Bill, Animal Diseases Act, The Animal (Prevention of Cruelty) Act and the Cattle Traders Act

Government was responsible for delivering animal health and veterinary services for a long time. However, in 1984, government stopped importing and distributing subsidised veterinary drugs and chemicals to farmers. Currently, government only imports certain veterinary products for use in control

programs for particular diseases such as Foot and Mouth Disease, Contagious Bovine Pleural Pneumonia and vectors such tsetse flies.

2.4.3 Animal Breeding Policy

Until the late 1990s, delivery of Artificial Insemination/ animal breeding services was the sole responsibility of government through the Animal Breeding Centre in the Ministry of Agriculture, Animal Industry and Fisheries. Government implemented a new animal breeding policy, which provides for a number of reforms in the provision of AI and animal breeding services.

Under the new animal breeding policy, government allowed private sector operators to import semen and AI equipment and to administer field AI services. The Animal Breeding Centre was transformed into a National Animal Genetic Resources Centre and Data Bank (NAGRC)by an Act of parliament. The new mandate of the centre is to promote, regulate and control as well as, import, export and market animal genetic material, including quality
assurance. The organisation is responsible for overseeing a transition from public delivery of AI services to commercial private sector led delivery.

2.4.4 The National Animal Feeds Policy

In 2005, Government developed the National Animal Feeds Policy which aims at stimulating increased feed production, ensuring quality of animal feeds on the market, reducing production costs and building capacity among private and public sector players for the purpose of developing the animal feeds industry. The policy provides the institutional framework to guide and regulate the feeds industry. The Ministry of Agriculture is the key central government institution responsible for coordination of the animal feeds policy. Its overall responsibility is policy formulation, setting standards, quality control and monitoring.

2.5 Broad National Development Policy Framework

i) Poverty Eradication Action Plan (PEAP)
Poverty in Uganda is mainly a rural phenomenon, with 48% of the population living in absolute poverty compared to 16% of the urban population. Poverty eradication is a fundamental objective in the government's strategy for rural development. The Government resolved to reduce the proportion of the population living in absolute poverty from the level of 44% in 1997 to below 10% by the year 2017 (PEAP, 2000). The Poverty

Eradication Action Plan (PEAP) is Uganda's comprehensive development framework, which guides the formulation of government policies. Under this plan, Uganda is to be transformed into a modern economy and modernization of agriculture is central in the process of transformation.

ii) Plan for Modernization of Agriculture (PMA)
The government's vision for rural development is embraced in the Plan for Modernization of Agriculture (PMA) which is a holistic, strategic and operational framework for eradicating poverty through multi-sectoral interventions enabling the transformation of the livelihood of the majority of subsistence farmers in Uganda (PMA, 2000). The main objectives for PMA include:

- Increasing household incomes and improving the quality of life of the poor subsistence farmers through increased agricultural productivity and access to markets

- Improving household food security,
- Providing gainful employment and
- Promoting sustainable use and management of natural resources

iii) The National Agricultural Research Policy
The National Agricultural Research Policy aims at focusing research services to address in a sustainable manner, the needs and opportunities of the poor in a market driven environment. The National Agricultural Research Policy promotes the delivery of high quality and efficient agricultural research services by enhancing the participation and co-ordination of the public as well as private service providers. The National Agricultural Research Organisation (NARO) is responsible for implementing this policy.

The National Agricultural Research Policy, 2003 provides for decentralisation of agricultural research services, promoting participation of private sector, civil society and farmers; separating public funding from research services deliver;
mainstreaming gender issues and concerns, social, human and environmental concerns, quality assurance of agricultural research services, as well as responding to market opportunities

iv) National Agricultural Advisory Services (NAADS)
Under the National Agricultural Advisory Services Policy, government established a decentralised, farmer-owned, demand driven and private sector-led agricultural advisory service delivery system. Farmers working in-groups identify priority enterprises and are assisted by local governments to contract competent private sector service providers to deliver the relevant inputs or services. The policy requires government extension workers to retire from the permanent and pensionable public service jobs in order to take up new positions with NAADS on short term contracts. During the current phase of transition from the traditional agricultural extension system, the central government provides all the funds to pay for the services and inputs. In future, however, farmers will demand and pay for all the services and inputs they require.

v) Policy to promote strategic exports
The government Uganda is implementing a program referred to as “Strategic Interventions to Promote Export of Selected Commodities". Its purpose is to enable the country to take advantage of new opportunities created by trading arrangements such as African Growth Opportunities Act (AGOA) of the USA, as well as bilateral and multilateral regional arrangements such as COMESA and EAC. Milk is one of the commodities identified as priority commodity/product under this program.

2.6 Dairy Industry Standards and Regulations

Dairy Development Authority is responsible for promoting and monitoring quality in the dairy industry through enforcement of standards and regulations. In liaison with the Uganda National Bureau of Standards (UNBS), the Authority developed new and updated the old standards in the dairy industry. The Authority (DDA) also developed the "The Dairy (Marketing and Processing of Milk and Milk Products) Regulations, 2003", Statutory Instruments No. 26 of 2003.

In order to facilitate the enforcement and monitoring of standards and quality along the dairy value chain, DDA registers and inspects all facilities and equipment used to handle, process and market milk and milk products throughout the country. Only operators whose facilities and equipment meet the stipulated minimum standards are given licenses to operate. Registration of new operators is carried out continuously and inspection of facilities and equipment for all operators is carried out on a regular basis.

The Authority also supports and facilitates dairy processing firms and milk traders to implement Good Manufacturing Practices (GMP), Hazard Analysis Critical Control Points (HACCP) and to comply with the requirements for International Standards Organisation (ISO) certification.

3.6.1 The Dairy (Marketing and Processing of Milk and Milk Products) Regulations, 2003

The Dairy (Marketing and Processing of Milk and Milk Products) Regulations, 2003 being implemented by DDA focuses on the following issues:

- **i)** Processing of milk or milk products
- **ii)** Marketing of milk or milk products
- **iv)** Operating of a factory in which milk is processed or is intended to be processed
- **v)** Controlling a store used or intended to be used for storage of milk or milk products
- **vi)** The business of transportation of milk or milk products
- **vii)** Dealing in dairy equipment

The regulations stipulate that a person shall not undertake any or all of the above activities unless that person is registered by the Authority and issued with a registration certificate. The document lays down the requirements to be met by applicants intending to process milk, set up a dairy store or premises with a milk cooler or freezer as well as the requirements for registration as a transporter.

2.6.2 Code of hygienic practice for milk and milk products

DDA in collaboration with UNBS developed the code of hygienic practice for milk and milk products.The document provides guidelines for hygienic production and handling of milk and milk products at different stages of the dairy value chain. The areas addressed include:

a) **Primary milk production:** Environmental hygiene, nature of premises, animal care, milking and milk handling equipment, health and hygiene of handlers, hygienic milking practices, collection, storage and transport of raw milk

b) **Handling and processing facilities:** Location, nature of premises, facilities and equipment, personnel, maintenance and sanitation, pest control and waste management

c) **Control of operations:** Control of food hazards, hygiene control system, incoming material requirements, processing, packaging, laboratory control, management, supervision, documentation and records, recall procedures, transportation, product information and consumer awareness

d) **Sale of milk and milk products:** The document lays down provisions/requirements for vending outlets, health and hygiene of vendors, as well as transportation and selling of milk and milk products

2.6.3 Standards for milk and milk products

The Uganda National Bureau of Standards (UNBS) is responsible for setting and enforcing standards of all products and commodities sold on the Ugandan market. UNBS in collaboration with DDA were

involved in a number of initiatives to develop new and review existing standards for milk and milk products. Below is a list of the existing dairy standards.

- **i)** US 8 CS 5:1993 Standard specification for whole milk powder, partly skimmed milk powder and skimmed milk powder
- **ii)** US 20 CS 1:1993 Standard specification for butter and whey butter
- **iii)** US 21 CS 11:1993 Standard specification for yoghurt and sweetened yoghurt
- **iv)** US 22 CS11:1993 Standard specification for flavored yoghurt and products heat-treated
- **iv)** US 33:1993 Standard specification for edible ices and ice mixes
- **v)** US 7:1993 Standard specification for labeling of packaged foods
- **vi)** US 28:1993 Standard specification for factory and employee requirements for food factories

At the East African Community level, EAC Member States have harmonized standards for the following dairy Products: UHT Milk; Yogurt (Sweetened and Flavored); Dried whole milk and skimmed milk powder; Unprocessed whole milk; Pasteurized liquid milk; Dairy milk ices and dairy ice cream; Milk based baby foods; Butter; Milk powders; Condensed milk, among others. In terms of sanitary requirements to control animal disease, it is mandatory in all countries that imports of dairy products be accompanied by Animal Health Certificate issued by a Competent Authority, i.e. agency of Government responsible provisional of Veterinary Services

2.6.4 Other legal instruments governing the sale of milk and milk products

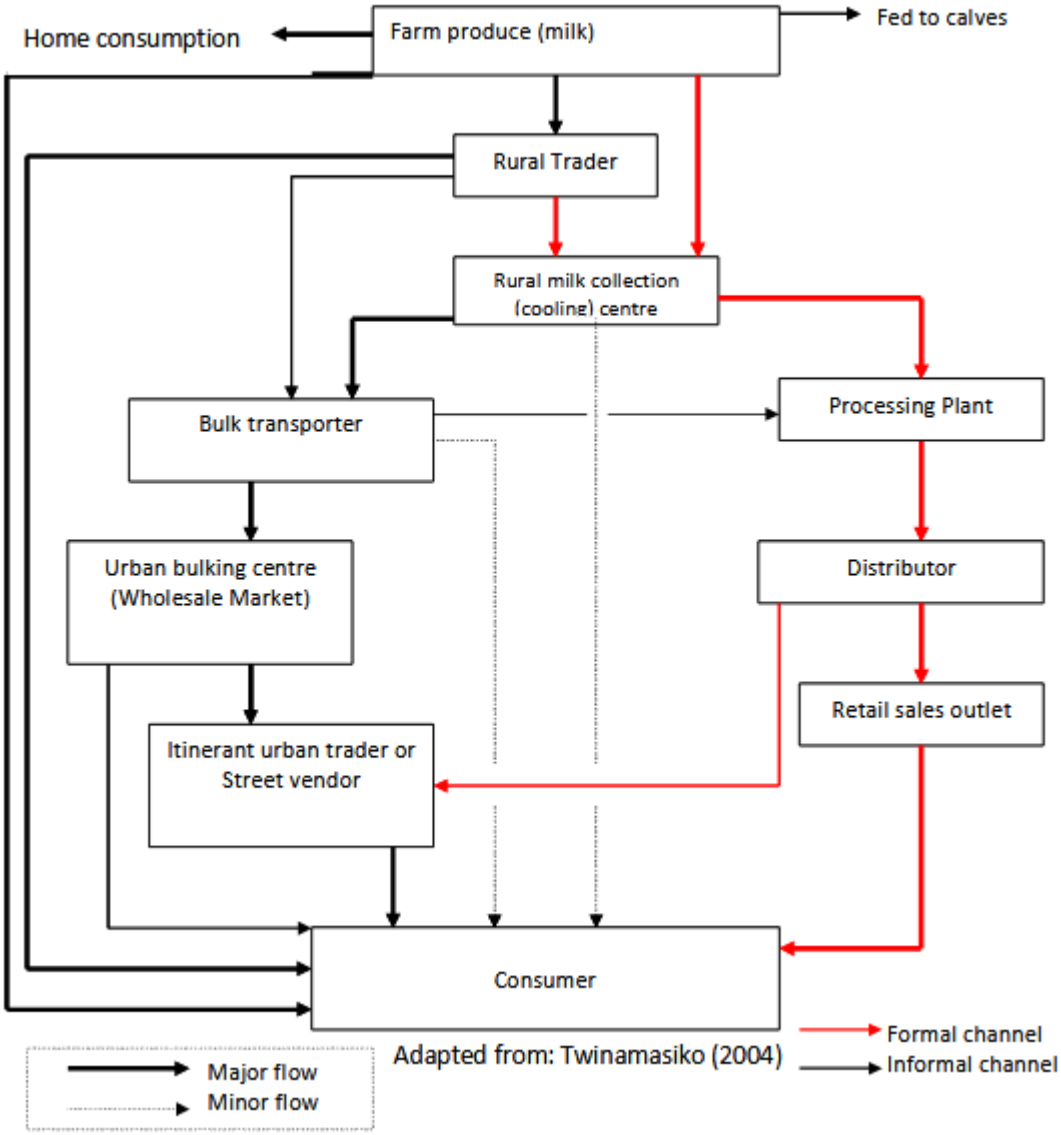
Other important legal instruments governing the sale of milk and milk products include the Public Health (sale of Milk and Milk Products) Rules, and Kampala City (Sale of Milk and Milk Products) Ordinance

2.7 Operating Licenses and Fees

Dairy Development Authority (DDA) requires all individuals and companies intending to undertake dairy related businesses to register and to pay annual registration fees. DDA carries out regular inspection of all facilities used to handle and/or process milk. Table 5 shows the operations that are licensed by DDA and the corresponding annual registration fees

2.8 Conceptual Framework

Figure 13: Milk flow through the formal and informal marketing channels



CHAPTER THREE

METHODOLOGY

3.0 Introduction

In details this chapter explains the research design of new technologies in software, server management, database systems, and hardware innovations in the past decade, dairy operations have been improved.

3.1 Research design

The Researcher has crossed-section study designs which investigated opinions and attitudes on both farmers and milk sellers in question concerning their milk management. It was both quantitative and qualitative; this because a lot of wording (qualitative approach) and figures (quantitative approach).

3.2 Study population

The research focused on the account, different users, the manager, the customers and the administrator of the dairy in question. The main questions were concerning their sales, customers and milk tank management. This was selected basing on the fact that it is a dairy in question and its retail business is service oriented and product oriented.

3.3 Sampling and sample size

Simple random and purposive sampling were applied to select the sample population for this study. Only respondents that met purpose were picked. These respondents had been chosen from the dairy staff and the customers body. The sample size that was used by the Researcher consists of 48 respondents which 15 were dairy staff member, 60 customers, 2 managers and one community leader.

Approaches	Selections	Type of sample and Sample size	Method of selections
Quantitative	Sample random Sampling	1 manager 4 Male labors 5 Female labors 60 Customers	Structured interviews
Qualitative	Sample random Sampling	1 deputy(manager) 1 community leader 60 customers	Interviews/ Questionnaires

3.4 Data collection Tools

3.4.1 Instruments for Data Collection

Data was collected using both structured and unstructured instruments and self administered questions which were largely semi-structured, the use of personal interviews, questionnaire focus group discussion to verify relevant aspects physically were open and closed -ended question, these methods were good enough to collect rich and detailed information about the the topic of study

For quality control, respondents were assured of confidentiality during interviews to enable appropriate responses. They were informed that their personal responses and objectivity were only necessary for accomplishing the study.

3.4.2 Questionnaires

A questionnaire is a series of questions asked to individuals to obtain statistically useful information about a given topic. The procedure of the questionnaire included both open and close-ended questionnaires, respondent answers were limited to a fixed set of responses that was, the respondents answered with a "Yes"or"No" that were good for the respondents for open ended questionnaire, no option or preferred categories were suggested. The respondents supplied their own answers without being constrained by a fixed set of responses.

3.4.3 Interviews

According to Charles Gomez and ted Jones (2009)"database system", an interview is a conversation with a specific purpose. Interviews are normally between two or more people(the interviewer and the interviewees) where questions are asked by the interviewer to obtain information from the interviewee.

3.5 Data Analysis

Qualitative and quantitative analysis techniques or processes were employed.

3.5.1 Qualitative data analysis

Qualitative research was used to indicate how people feel and why they feel as they do. It concerned with collecting in-depth information asking questions such as why you say that. The data was continuously analyzed during data collection, matters first identified, written in margin and later assembled together for a collective decision from the Researcher.

3.5.2 Quantitative data analysis

Quantitative research was used to measure how many people feel, think or act in a particular way. The data was edited before leaving the respondents. The Researcher checked for uniformity, occupancy, consistency, legibility and comprehensiveness using software applications such as Microsoft excel and SPSS to show the responses of the respondents on different variables and find the relationship between these variables.

3.6 Data Presentation

3.6.1 Qualitative Data Presentation

By the final stages of the qualitative data analysis, the Researcher organized data so that general themes could be formulated. Concepts were refined and linked together in order to create a clear description of the current study.

3.6.2 Quantitative Data Presentation

Data was assembled and put into a tabular and graphical form. This reduced data from detailed to a summarized form as respondents had to emphasize their opinions. The Data was edited from the field and generalized into a global idea accordingly to the objective of the study.

3.7 System Design

It is the most creative and challenging phase of the system life cycle. We began the designing process by identifying forms, reports and the other outputs the system would produce. We sketched the forms, the displays, as expected to appear, on paper, so that it served as model for the project to begin. Finally we designed the form on computer display, using one of the automated system design tool that is VISUAL STUDIO as front-end which provides more of the actual code for a programmer than any other non-visual programming language because of its windows, buttons, lists and other application features such as menus that are built-in to the BASIC programming language. Microsoft Access 2007 database was used as back-end.

3.8 Research Procedures

After writing the proposal and it has been approved, the faculty issued a letter that helped the researcher to undergo the research and implement an information system which could be an applicable.

The study attempted to develop a reliable and manageable Electronic dairy management system intending to support the design, implementation, analysis, interpretation, and quality evaluation of registries created to increase understanding of milk outcomes.

CHAPTER IV
ANALYSIS & DESIGN

4.0 Requirements Analysis

4.1 Functional Requirements

The following are the sets of functional requirements that were generated and formed the basic of evaluation.

- The system should able to input item information using data entry forms.
- The system should able to generate reports for all items received, used and suppliers.
- The should allow items in stock to be updated by the same supplier and it allows administrator to delete any item from the database.
- The system also generates reports of particular item flow, in stock and out stock.

4.2 Non-functional Requirements.

The following are the non-functional requirements that have been outlined.

- The system is able to add new suppliers to the system database.
- The system is able to generate reports of a particular supplier and their addresses.

4.3 System Design and Analysis

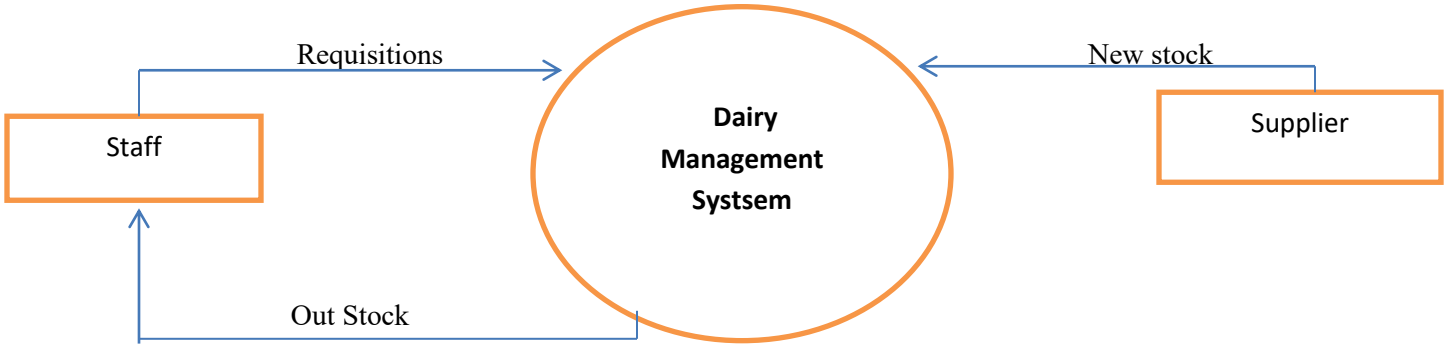
As discussed earlier. A system refers to related components working to achieve a given objective, systems design shows how the various parts have been arranged to forms the system . It comprises of two levels; logical and physical design . The logical design includes output and input layout and files, tables and structures whereas physical design may include actual coding, deleting of data files, modifying exiting programs and data strutures etc. the physical design of this project comprises mainly cording based on the current existing manual stock system. The system is file based.

4.3.1 Data flow diagrams

Context Diagram

The context diagram identifies external entities the system interacts with it shows boundaries of the system.

Figure 3.1: Context Diagram



4.4.2 Data flow Diagram

A data flow diagram is a tool that enables us picture a system as a network of the functional processes connected to one another by data flows and data depositories or stores.

The following were the tools used;

Figure 3.2: Tools for DFD

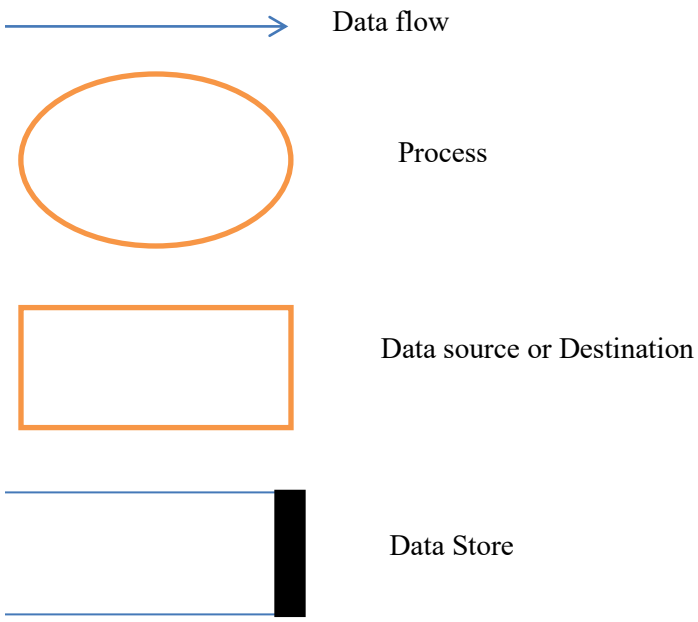
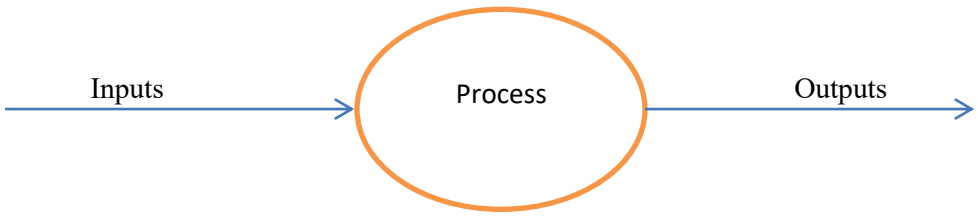


Figure 3.4 Transformation process



4.5 Data inputs.

For a system to be considered complete and functional, it must have data inputs.

The following are the data inputs for the system.

- In stock details, these include all the information attached to an item that is being stocked. Such as item name, data of purchase, purchase price, quality purchased and the supplier.
- Out stock/ requisition details, these consist of all details pertaining the item that has been taken out of store, Such as item name, quality taken out, taken by, authorized by who and the date when the item is taken out.
- Supplier details since only the esteemed suppliers are entitled to the Hope dairy, therefore, details have to be captured such as supplier name, address, phone number and any other details.

4.5.1 Process.

The system is expected to perform a number of processes in order to transform the input listed above into outputs to be discussed.

The processes include the following;

- It sorts the item in stock by name.
- It computes the balance in stock after a requisition transaction has been made and this is done by subtracting taken from the amount available in stock.
- The system also processes and generates all the necessary report.

4.5.2 Data outputs

Millions of money is invested in building information and management systems irth the end result of data output, therefore, the system gives out data basing on the data that was inserted in it. (garbage in- garbage out).

The following are the data out puts that are considered relevant to the system objective.

1. Report of all the items in stock.
2. Report of all the item that have been taken out.

3. A report of a particular item flows.
4. A report of all the esteemed suppliers.

4.6 Conceptual Database Design Model

Before coming up with the conceptual database model for Dairy Management System for Hope Dairy store, the various components data models were first identified and these components include;

- The entity types
- The attributes
- Relationship types

4.6.1 Entity Relationship Modelling

Entity Relation (ER) models allow for the formation of high level conceptual data models and these can be used once the requirements have been collected and analysed to create conceptual schemas, which form the general graphical presentation of the database design. The ER model consists of entities and each entity is composed of attributes which are the properties that describe an entity.

The following below are the tables that were used to design Dairy Management System for Hope Dairy.

Figure 3.5 Showing attributes for Login table

FIELD NAME	DATA TYPE	DESCRIPTION
No_ID (primary key)	Varchar (15)	
Username	Varchar (25)	
Password	Varchar (25)	

Figure 3.6 Showing attributes for Milk entery table

FIELD NAME	DATA TYPE	DESCRIPTION
ID_primary key	Varchar (15)	
Type	Varchar (25)	
Name	Varchar (25)	
Lts	Varchar (25)	Number for the litter of milk entry
Fat	Varchar (25)	
Date	Date	Date when item is taken in
From,To	Varchar (25)	When it entered

Figure 3.7 Showing attributes for Customer table

FIELD	DATA TYPE	DESCRIPTION
ID_ (primary key)	Varchar (25)	
Name	Varchar (25)	
Father name	Varchar (25)	
Join date	Date	
Phone	Varchar (25)	
Address	Varchar (20)	

4.6.2 System physical Design

The physical design of a system is concerned the actual physical implementation of the logical design as already discussed earlier. The section describes the actual processes of inputing, verifying and storing the in stock and out stock information, physical layout of the data stores, report formats and relation database management system used.

4.6.3 Database Management System (DBMS)

A DBMS is an application that contracts expands and maintains the database while a database can be defined as a collection of structured related data.

The research adopted MySql database management system because MySql is Open Source software. As such you are free to examine the source code and make any changes you wish. As per its license, you are free to redistribute those changes as long as your software is also Open Source.

An independent study by Davis found Mysql to be one of the top performers in a ground that included DB2, Oracle, ASE, and SQL Server 2000. MySql is used by a variety of corporations that demand performance and stability including Yahoo, Slashdot, Cisco, and Sabre. MySql can help achieve the highest performance possible with your available hardware, helping to cut costs by increasing time between server upgrades.

One great advantage of using MySql is its cross-platform capabilities. You can develop your database on a windows laptop and deploy on Windows Server 2003, a linux server, an IBM mainframe, or an Apple Xserve, just to name a few potential platforms. This gives you a lot of versatility when choosing server hardware. You can even set up replication using a master on a windows platform with Linux slaves. It's incredibly easy to move between platforms: on most platforms you can simply copy the data and configuration files between servers and you are ready to go.

4.6.4 Programming Language

MySql is not friendly to most of the non technical users therefore it needs an application alongside it for the users to interact with when manipulating and loading data in it.

The researcher found Visual Basic.Net viable because of its new Windows Forms, developers using Visual Basic.Net can build Windows-based applications that leverage the rich user interface features available in the Windows operating system. All the rapid application development (RAD) tools that developers have come to expect from Microsoft are found in Visual Basic.Net, including drag-and-drop design and code behind forms. In addition. New features such as Milk Diary resizing eliminate the need for complex resize code. New controls such as the in-place menu editor deliver visual authoring of menus directly within the windows forms designer, combined with greater application responsiveness, as simplified localization and accessibility, these new features in windows Forms make Visual Basic.Net the choice for today's Visual Basic developers.

4.6.5 Program Architecture

The system has been designed as a stand alone system; therefore it can be installed on a single machine at the Hope Dairy store where tractions are made. The user can be authenticated on that particular local machine to access the system.

4.6.6 Storage

The storage capacity of this Milk Dairy Management System depends largely on the hardware gadgets available. But since data will always be added and added into the system, its recommended to have a hard drive with a large storage capacity, also enough RAM, high processing speed will be an advantage so as to enable processing and manipulation of data very easy.

4.6.7 Accuracy

The system has been designed to ensure there is a high degree of accuracy such as calculating the balance in stock, tracking the flow of how a particular item has been used.

4.6.8 Security

No illegal user can access the system; this is because the system has been designed with high integrity security mechanism where by the user need to have a user name and password before he or she logs into the system, hence ensuring security of the information.

4.7 Systems design

4.7.1 Getting Started with Dairy Management System

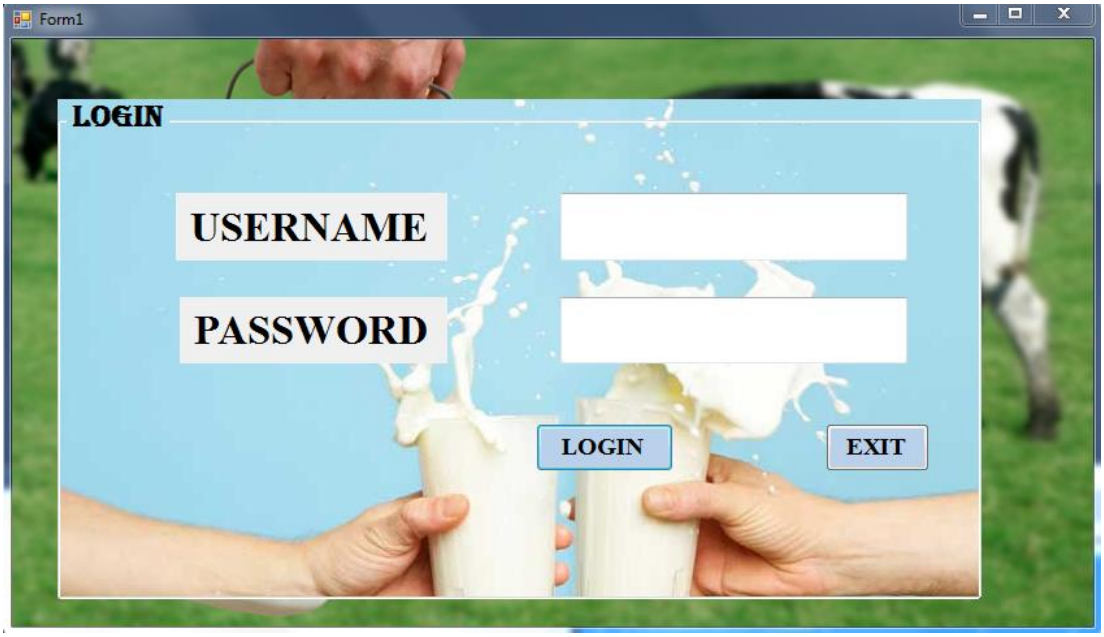
After the final coding of the system, the system was then rapped as an executable file which can eneble it be installed on any machine without visual basic.Net software. When the system is installed on any machine, all the installation files are copies into one directory in the programme files and short cut icon is places on the desktop.

To start the system, double click on the shortcut icon for Dairy Management System., a flash screen will show up indicating the version of the system and its developer then log on form will pop up.

Figure 4.1 Showing a Flash Screen of Dairy Management System

Login Form

Security of information is the first thing each manager will put into consideration, for Dairy Management System. No an authorized user can access the system. Only legal users with correct user name and password can log into the system.



The login form is presented with two text boxes and two command buttons as shown in the figure above. Enter the correct user name and password in their respective text boxes and then click the “Login” command button or else click ”Exit” command button this will cancel the login form and you cannot access the system.

Main Form

The main form acts as a navigation point of all the system, through the main form, you can access any part of system depending on your level of authentication. Some legal users will not access some forms that are not in their area of concern. Only the administrator will be allowed to access everything in the system.

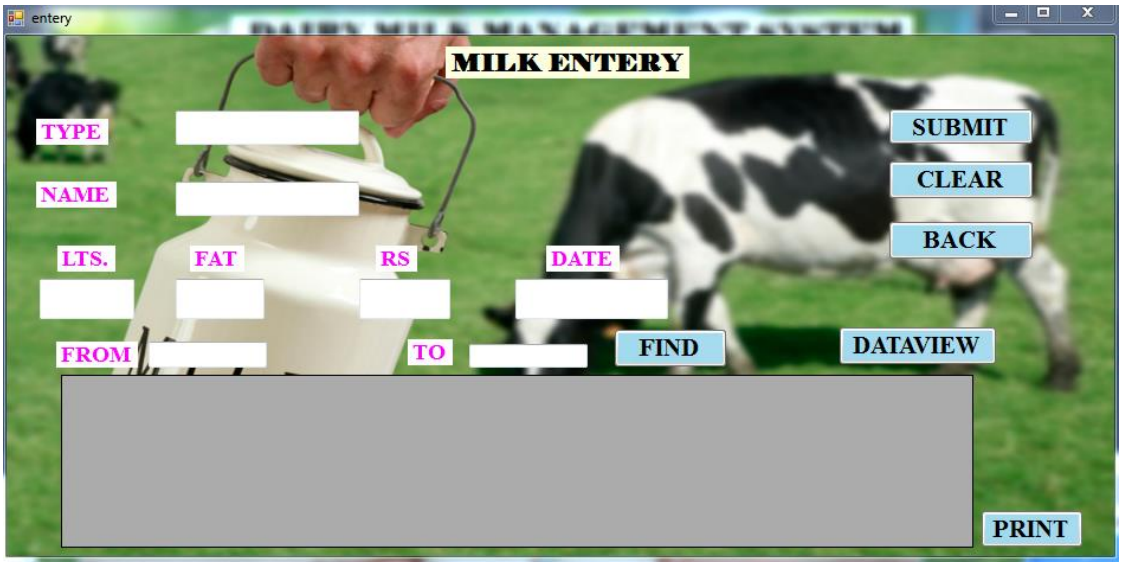
Data Milk Entry Form

Of course every goods has to communicate with the database; data is posted in the database via the data milk entry form. All the data entry forms are designed to allow a novis user click on just a single button to post the data. Data milk entry form have a number of buttons, a single button on data milk entry form is coded to post data into the database, the other views the data in the database and another button views the report.

The form also have the buttons that closes them.

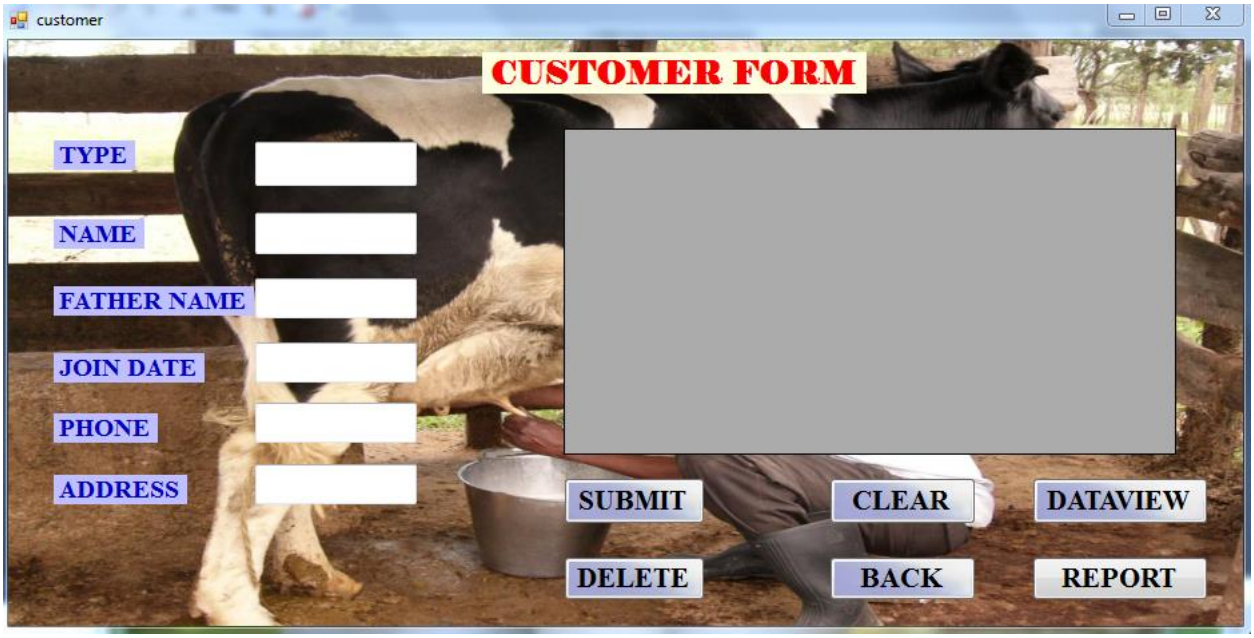
Dairy Management System has a number of data milk entry form and these include

- Type
- Name
- Lts,Fat,Rs
- Date
- From,To



Customer Form

Every customer of the system has to be known, the customer is assigned an ID number that will enable him to identify into the system. Only the administrator can add a new customer into the system this implies its only the administrator to access the customers form ion the main menu.



CHAPTER V

5. IMPLEMENTATION, TESTING AND EVALUATION

5.1 Implementation

Implementing a new system can be carried out in two different forms and these are Direct implementation and parallel implementation

5.2 Direct Implementation

Under this form of implementation there is a direct cut over of the old system while the new system takes it course. In direct implementation, the users stop using the manual system and start using the computer system there and then. The advantage of this method is that it does not need more man power hence making it less costly while on its negative point of view if the new system fails to operate effectively either due to an expected error, this can lead to loss of data since it was implemented. Therefore I do not recommend serious organizations to that deal with serious information to use this method of system implementation.

5.3 Parallel Implementation

Under this method, a new system is implemented alongside an old system, this implies both the new and old system will be running simultaneously until when the new system proves its integrity over the over the old one. This has an advantage over the direct cut method. This is because safety of data is guaranteed however: it will need more man power to run the new system hence making it more disadvantageous.

Due to advantages the parallel implementation method has over the direct cut, therefore, in this project, the parallel implementation method is recommended.

5.4 Coding and debugging the system

Coding and debugging the system may be in simple terms referred to as programming. For the case of Hope Dairy store, the researcher designed and developed the Dairy Management System using the object oriented programming language and that is Visual Basic.Net express edition alongside MySQL Database management system.

4.4 Discussion

The system was designed to fulfill the basic aim and specific objectives that were proposed at the earlier stage of the system development. A system comprises of people, equipment, space and procedures. The researcher was mindful of the input, processing, storing and retrieving requirements necessary for an effective system. The main users to interact with the system are the store managers and the administrators who, shall input and process in stock and out stock data as the Dairy may deem necessary.

In any software development, security is always a very important issue for consideration. The administrators should therefore make use of authorized persons to take charge of the system. It is thus management obligation to ensure internal controls and security about the system, the system cannot be accessed by any user except the authorized user with the login ID and password.

4.5 Limitations

It is not usually possible to design a system that meets the needs of every user. This system therefore has the following limitations;

There are fixed queries that have been designed by the researcher. This means that the users cannot run queries of their choice unless the system is upgraded.

4.5 Problems Encountered

The following problems were encountered during the development process of the system.

- Limited time to enable development of a program with better features.
- In accessibility to the most current literature on software development.
- Despite the normal programming procedures followed, some segments could not run normally especially in the viewing forms, may be due to computer memory problem since Visual Basic.Net takes allot of memory.

5.8 Conclusion

For a University, such as St. Lawrence University in Hope Dairy to manage the ever-increasing in stock and out stock information, there is always needed to incorporate Dairy systems to support the manual systems. This Dairy System has great capabilities to support store manager's efforts especially in processing in stock and out stock reports. Administrators can also use the system for accessing the items remaining in stock and how the item has flow by running queries on item flow. Item flow shows how a particular item has been used and it shows the balance in stock, also a report can be printed out for the authorities to make decision on either to have a new stock depending on the report.

Secondly, because of limited time, other important features such as security checks, editing and deleting records or files, which would make the system more perfect, were not incorporated. Other features such as printing of reports are not included in the program.

4.6 Recommendations

First of all, it's important that the Hope Dairy continues to use the old manual system alongside the new Dairy System especially that this has been a stock system and may not be that perfect to meet all the challenges of the Dairies.

The users need to be trained on how best they can use the new Dairy Management System. Users with basic computer skills will be required in order for them to appreciate the functionality of the program.

The system can also be designed in any other programming language such as Visual basic 6, FoxPro etc. This will enable users to run variety of queries according to their interest, unlike visual basic. Security checks can also be incorporated in the system for example the use of authorized users, which can be achieved by improving the system to make use of passwords.

Possible areas of enhancements may further include: orders and purchases while considering the accounts.

References

http://www.google.com/

*https://search.yahoo.com/yhs/search?hspart=trp&hsimp=yhs-001&*type=118635_110617&p=dairy+farming+in+uganda

http://www.fao.org/docrep/T3080T/t3080T04.htm

Balikowa, D. (2004): Participation of Small-Scale Dairy Producers in Rationalization and Harmonization of Dairy Sector Policies and Regulations in Eastern Africa, South-western Uganda Milk-Shed Study Report, RELMA/ ECAPAPA, January 2004.

DDA, (2004): Annual Report 2003/2004, Dairy Development Authority, Kampala, Uganda.

EADD, (2009): Project Baseline Survey Report No. 3, Heifer International/East Africa Dairy Development Project (EADD), Kampala, Uganda
Ebong, C., F. Ejobi, J. Kabirizi, J. Oloya, J.D. Kabasa, P. Isabirye and R.

Livingston, (2007): Methane emissions from the cattle population in Uganda. J. Anim. Vet. Adv., 6: 399-403

FAO, (2010): Status of and Prospects for Smallholder Milk Production – A Global Perspective, by T. Hemme and J. Otte. Rome.

Bills, Linda. (2000). Technical services and integrated library systems. Library Hi Tech 18(2), 144-150.

Connolly Thomas and Naveggs Caraln, Database-A practical approach to design, implantation and management, 3rd edition.

John, Diebold, (1950). Man and the Computer: Technology as an agent of Social change. Published by F.A Praeger 1901

Micheal, Widenius. (2002). Computers and Database Management

The waite groups 1999 supte bible visual basic 6 new Delhi tech media

William, Hutchinson (1999). Information Warfare: Corporate Attack and Defense in Digital World. Irish Publications.

Interview Guideline

Interviewing the Administrator

1. When did Hope Dairy?

2. What were the objectives of staring up Hope Dairy are the objectives of the organization?

3. What are the goals of the Hope Dairy?

Interviewing the Store Manager

1. When did you start keeping stock record?
2. How do you request for stock?
3. How do you receive stock?
4. How do you give out items out of the store?
5. When do you update goods in stock?
6. How do you record the in stock and out stock data?
7. Which type of system do you use to record data?
8. How long does it take to record data using the mentioned system?
9. At the end of the day which reports do you always generate?
10. Who uses the reports generated?